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New records of phyllostomid bats for the state of Mato Grosso and for the Cerrado of Midwestern Brazil (Mammalia: Chiroptera)

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Abstract: We report new records of eight species of phyllostomid bats for the state of Mato Grosso. Two of them, *Micronycteris microtis* and *Platyrrhinus brachycephalus*, also represent new records for the Cerrado biome. Furthermore, we provide measurements and comment on their taxonomy and conservation. With these records, the Mato Grosso state and the Cerrado biome currently comprises 92 and 103 species of bats, respectively.

Key words: bats, Cerrado, conservation, taxonomy, distribution

Chiroptera is the second most diverse order of mammals in Brazil with 178 species distributed in 68 genera and nine families, which correspond to about 25% of the Brazilian mammals (Nogueira et al. 2014). Phyllostomid bats are endemic to the New World and represent the richest bat family in the Neotropical region with 43 genera and 92 species occurring in Brazil (Nogueira et al. 2014).

Despite the high diversity and ecological relevance of phyllostomids, there are large gaps of knowledge on the occurrence, biology and distribution of species in Brazil. Nearly 60% of the territory does not have a single record of a bat species, and less than 10% is minimally sampled (Bernard et al. 2011). Habitat loss and fragmentation are the major threats for mammals (Costa et al. 2005), and this is also true for most bat species. Recent data point out that more than half of the original areas of the Caatinga (53% of the original land cover) and Cerrado (51%) have been severely modified by human activities, in particular by agriculture, leading to a risk of extinction of endemic species (Ratter et al. 1997; Castelletti et al. 2003; Costa et al. 2005; MMA 2011). These biomes are the least known, with 7% of the Caatinga and 6% of the Cerrado sampled for bats; but all Brazilian biomes are poorly sampled for bats as a group (Bernard et al. 2011).

The Cerrado—a biodiversity hotspot in Midwestern Brazil—is under severe anthropic pressure. In many localities only tiny fragments remain. This high habitat fragmentation is pushing some mammal species to local extinction, and this is more critical for endemic species such as the two nectar-feeding bats, *Lonchophylla dekeyseri* Taddei, Vizotto & Sazima, 1983 and *Lonchophylla bokermanni* Sazima, Vizotto & Taddei, 1978 (Costa et al. 2005). The Cerrado is third, after the Atlantic Forest and Amazon, in species diversity of bats, with about 101 species (Paglia et al. 2012; Sousa et al. 2013).

Mato Grosso has an area of approximately 904 km², and 39% is covered by Cerrado (IBGE 2014). This region is one of the most poorly known for bats in Brazil. Since 2005, results of bat surveys have not been published, and only three new records of bat species have been recently recorded for the state. Therefore, it is considered a priority area for bat inventories (Bernard and Sampaio 2008; Bernard et al. 2011). Currently, approximately 84 bat species belonging to eight families are known to the state (Bernard and Sampaio 2008; Reis et al. 2013; Sousa et al. 2013).

The Sesc Serra Azul (SSA) is a private Unit located inside the Area of Environmental Protection (APA) of Cabeceiras do Rio Cuiabá, in the south-central Mato Grosso state (14°29′56.7″ S, 055°44′01.4″ W), spanning approximately 5,000 ha (Figure 1). The study region has a typical cerrado landscape: dense grassland with sparse

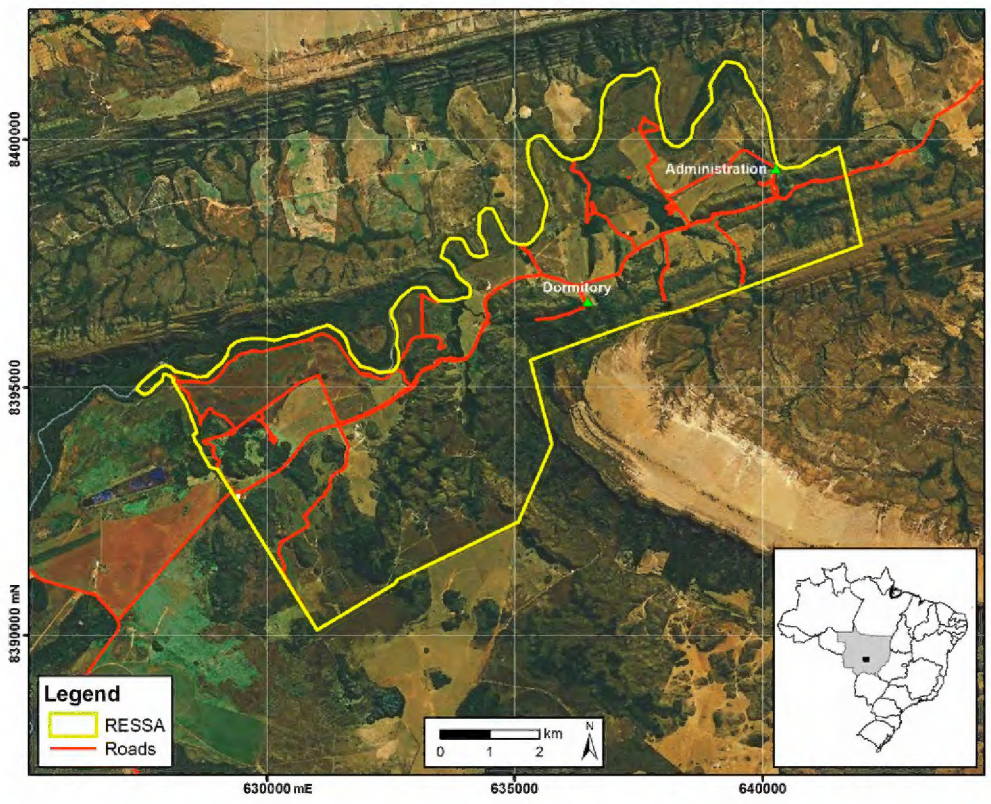

Figure 1. Map showing the boundaries of Sesc Serra Azul and heterogeneity of vegetation.

covering of shrubs and small trees (cerrado *sensu stricto*), cerrado on rocky soils in areas where the relief is gently rolling relief, cerradão (woodland savanna), seasonally dry forests, with or without babassu palm (*Attalea* spp. [Aracaceae]), riparian forest and seasonally flooded forests (Cambarazais with *Vochysia* [Vochysiaceae] and buritizais with palm groves of *Mauritia flexuosa* [Aracaceae]). Several of these natural areas have been replaced by pastures or crops, resulting in a mosaic of natural vegetation and anthropogenic patches. The regional climate is Aw (Köppen-Geiger) – Tropical, with rainfall concentrated in the summer.

Specimens were captured during three field expeditions between August 2012 and August 2013. Bats were captured using ground-level mist nets. Only a few adults representing each species sampled were collected. The age class was determined by the degree of closure of the epiphyseal growth plates of the phalanges (Kunz and Anthony 1982). On each night, we set up the nets at ground level, along trails or in clearings and groves, at different sites (Table 1). These nets were open from 6 hours after sunset, and were checked every 40 minutes. The total sampling effort was 515,700 $m^2 \cdot h$. The specimens were collected under ICMBio/ SISBIO licenses 28198/1 2011-14 and 39984/2013, and handled following the procedures described by the American Society of Mammalogists (Sikes et al. 2011). Voucher specimens were preserved in alcohol 70% or prepared as dried skins and skulls and deposited in the mammal collection at the Museu Nacional (MN), Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

Specimens were identified using the keys available in Gardner (2008a), taxonomic revisions by Hernandez-Camacho and Cadena (1978), Medellin et al. (1985), Simmons and Voss (1998), Velazco et al. (2005, 2010), and original descriptions (Tomes 1863; Dobson 1879; Miller 1898; Thomas 1901; Allen 1904; Sanborn 1935; Rouk and Carter 1972; Lassieur and Wilson 1989; Simmons 1996). We measured 12 external characters defined by Vizotto and Taddei (1973), along with the measurements of nasal leaf (Bogdanowicz et al. 1997), as follows: body length (BL), tail length (TL), forearm length (FA), calcar length (CL), hind foot length (HF), ear length (E), tragus length (TR), tibia length (TI), thumb length (TH), noseleaf length (NL), noseleaf width (NW), and horseshoe width (HW). The mass was obtained using dynamometers with accuracy of 0.1 g for the smaller individuals, 1 g for medium-sized bats, and 2 g for the larger bats. We also measured some cranial characters defined by Vizotto and Taddei (1973), as follows: greatest length of skull (GLS), mandibular length (ML), length of maxillary toothrow (MAX), length of mandibular toothrow (MTR), postorbital breadth (POB), zygomatic breadth (ZYG), and breadth of braincase (BBC). Measurements were taken with digital calipers accurate to 0.02 mm. Means for external and craniodental measurements of all species are summarized in Tables 2 and 3, respectively.

In the present study, we report eight new records of phyllostomid bat species for the state of Mato Grosso: *Hsunycteris thomasi* (J. A. Allen, 1904), *Lampronycteris brachyotis* (Dobson, 1879), *Lonchorhina aurita* Tomes, 1863, *Micronycteris microtis* Miller, 1898, *Micronycteris sanborni* Simmons, 1996, *Micronycteris schmidtorum* Sanborn, 1935, *Platyrrhinus brachycephalus* (Rouk & Carter, 1972), and *Platyrrhinus recifinus* (Thomas, 1901). The species accounts, with comments on their identification, distribution and conservation, are as follows.

Table 1. Characterization of the study areas, with species occurrence and habitat description.

Habitat	Species	Habitat description
Cerrado	*H. thomasi, M. schmidtorum, M. sanborni*	Cerrado *sensu stricto*
Cerrado-pasture	*H. thomasi*	Transition area between Cerrado and Pasture
Forest/ river	*L. brachyotis*	Humid forest around a river that was shallow and has slow watercourse
Buriti forest	*L. aurita*	Waterlogged buriti forest with dense canopy
Moist forest	*L. aurita*	Near a stream of a waterfall, forest is moist with dense vegetation
Cave	*L. aurita, M. microtis*	Inside a humid forest with dense canopy
Babassu	*M. microtis*	Forest with high vegetation and dense canopy
Cambarazal	*M. sanborni*	Inside Cambarazal forest with dense canopy
Forest/ babassu	*P. brachycephalus*	Inside forest with dense canopy, near a water stream
Babassu forest	*P. recifinus*	At the forest edge with low vegetation and open canopy

Table 2. External measurements (mm), weight (g) and sex (F/M) of the specimens captured in Sesc Serra Azul. The dash indicates that the dimension was not measured.

	MN 80518	MN 80592	MN 79731	MN 79798	MN 79802	MN 79839	MN 80550	MN 80551	MN 80534	MN 80573	MN 79755	MN 80572	MN 80523	MN 79726	MN 79739
Species	***H. thomasi***	***H. thomasi***	***L. brachyotis***	***L. aurita***	***L. aurita***	***L. aurita***	***L. aurita***	***L. aurita***	***M.microtis***	***M. microtis***	***M. sanborni***	***M. sanborni***	***M. schmidtorum***	***P. brachycephalus***	***P. recifinus***
Sex	F	F	F	M	M	M	M	F	F	F	M	F	M	F	F
W	8.5	8.0	11.0	11.0	13.5	16.0	18.5	17.0	10.0	12.5	7.0	8.5	9.0	15.0	25.0
FA	33.70	33.60	43.76	48.54	49.72	48.72	50.03	49.68	35.52	36.01	33.44	34.51	36.93	39.0	47.20
BL	44.24	46.97	56.78	50.50	51.88	-	55.15	53.66	40.65	42.32	44.00	43.64	42.90	54.0	62.20
TL	8.74	-	11.00	46.26	48.50	-	52.60	53.61	14.71	15.17	13.50	12.71	11.88	-	-
CL	5.85	5.14	12.29	13.49	17.12	11.76	15.67	12.04	15.42	14.52	7.69	7.17	10.81	3.43	4.52
HF	8.55	9.96	9.26	10.48	10.56	9.51	9.90	10.39	9.18	9.05	7.70	8.45	10.04	8.00	10.80
E	13.35	13.26	16.26	28.00	23.2	23.74	27.13	27.89	18.43	18.46	19.50	21.51	23.50	16.38	15.20
TR	5.19	4.16	5.05	13.36	12.27	13.49	15.38	15.87	5.56	7.78	4.55	4.89	8.82	4.05	4.61
TI	13.10	13.46	18.47	23.94	21.33	22.57	22.99	22.81	14.97	15.88	15.17	15.52	17.94	14.67	17.91
TH	6.49	7.24	9.79	8.68	8.62	8.60	6.96	8.24	9.60	7.19	6.64	6.32	8.11	7.88	10.44
NL	6.02	5.25	8.28	24.52	25.08	22.50	26.60	26.87	8.35	8.74	6.58	8.24	9.40	9.02	10.83
NW	3.93	3.66	4.49	6.36	7.56	5.65	6.51	7.82	3.69	4.23	3.16	3.72	3.53	3.38	4.08
HW	4.38	4.66	-	5.03	6.54	6.70	6.89	6.60	3.95	5.03	4.01	4.36	4.41	5.35	6.55

Hsunycteris thomasi (J. A. Allen, 1904)

In Brazil, this species has been recorded in the states of Acre, Amazonas, Amapá, Roraima, Pará, and Tocantins (Reis et al. 2013). Griffiths and Gardner (2008), and Peracchi et al. (2011) also considered its occurrence in Rondônia. *Hsunycteris thomasi* occurs mostly in humid areas near streams and clearings in primary forests, and it is also associated with human-modified habitats such as cultivated areas (Reid 1997; Reis et al. 2013). We collected two adult females (MN 80518, 80592). One was collected in a cerrado *sensu stricto* area (14°28′40″ S, 055°43′19″ W), and the other was collected in a cerrado-pasture transition area (14°30′48″ S, 055°46′54″ W), confirming its occurrence in both natural and anthropic habitats.

The species was originally included in the genus *Lonchophylla*, but it was allocated to the newly described genus *Hsunycteris* Parlos et al., 2014. Our specimens can be identified as *H. thomasi* by the following set of traits: blackish-brown ears; darkbrown dorsal fur; light brown ventral fur; internal lower incisors trilobed and larger than the external lower incisors (Figure 2), which are separated by gaps from canines; internal upper incisors larger than the external ones and separated from them by gaps; presence of a gap between the external incisors and canines; large gap between the upper canines and the first premolars; zygomatic arch absent. The dental formula is i 2/2, c 1/1, p 2/3, m 3/3 = 34. All of the characteristics described here were previously observed by other authors (Allen 1904; Griffiths and Gardner 2008; Reis *et. al.* 2007; Reis *et. al.* 2013), and the cranial measurements of the MN 80518 are in the range of *H. thomasi* (Table 3) provided by Griffiths and Gardner (2008).

Lampronycteris brachyotis (Dobson, 1879)

In Brazil, this species has been recorded in the states of Acre, Amazonas, Pará, Tocantins, Piauí, Paraná, Bahia, Espírito Santo, and São Paulo (Peracchi et al.

Figure 2. Lower incisors of *H. thomasi* (MN 80518) showing that the inner incisors are larger than the outer incisors.

Table 3. Cranial measurements (mm) of the specimens captured in Sesc Serra Azul. The dash denotes that the characteristic was not measured because either it is absent in the species or the skull is partially broken.

	MN 80518	MN 79731	MN 79839	MN 80534	MN 79755	MN 80572	MN 80523	MN 79726
Species	***H. thomasi***	***L. brachyotis***	***L. aurita***	***M. microtis***	***M. sanborni***	***M. sanborni***	***M. schmidtorum***	***P. brachycephalus***
GLS	20.26	20.94	19.55	18.22	16.85	17.65	18.03	21.19
ML	14.03	14.48	12.51	11.87	10.40	10.72	12.29	14.24
MAX	7.05	8.37	6.63	6.74	5.99	6.08	7.03	7.52
MTR	7.30	9.12	7.22	7.36	6.41	6.58	7.42	7.87
POB	4.09	5.05	4.67	3.94	3.85	4.38	4.01	5.10
ZYG	-	-	10.63	-	-	8.09	9.65	12.06
BBC	8.00	8.69	8.73	7.55	-	7.22	7.79	8.48

2011; Reis et al. 2013), which include Amazon, Cerrado, and Atlantic Forest (Medellín et al. 1985; Marinho-Filho and Sazima 1998; Tavares et al. 2008). This species is more frequently found in areas with preserved canopy vegetation in evergreen and deciduous lowland forests, but seems to be sensitive to habitat disturbance (Reid 1997). We collected one adult female (MN 79731) using a mist net placed transversely to a stream that was bordered by a forest (14°29′00″ S, 055°43′07″ W).

Lampronycteris brachyotis is a small to medium-sized Phyllostominae (FA 38.0–43.6 mm; Reis et al. 2013). The MN 79731 has pointed ears without a cutaneous band connecting them; the dorsal fur is orange, and the ventral fur is yellowish-orange; the lower rim of the horseshoe of the noseleaf is defined by a ridge; and the lower lip and chin have a pair of smooth tubercles divided in the midline by a V-shaped groove. The third metacarpal (39.6 mm) is longer than the fourth (38.3 mm). The cranial and dental features include an inflated rostrum, especially in the lacrimal region; the upper incisors chisel-shaped, and aligned with canines; the upper inner incisors less than one-half of the height of the upper canines (Figure 3); the upper outer incisors visible in frontal view; and the lower incisors trilobed. The calcar length is similar to the length of the foot; the dental formula is i 2/2, c1/1, p 2/3, m 3/3 = 34. All of the characteristics described here were previously observed by other authors (Dobson 1879; Sanborn 1949; Simmons 1996; Reid 1997; Simmons and Voss 1998; Williams and Genoways 2008; Peracchi et al. 2011; Rocha et al. 2013).

Figure 3. Upper incisors and canines of *L. brachyotis* (MN 79731) showing that the inner incisors are less than half of the height of the canines.

Lonchorhina aurita Tomes, 1863

In Brazil, this species has been recorded in the states of Amazonas, Roraima, Pará, Maranhão, Piauí, Pernambuco, Bahia, Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, Mato Grosso do Sul, Goiás, and Distrito Federal (Peracchi et al. 2011; Reis et al. 2013). *Lonchorhina aurita* is associated with forests (Tuttle 1970; Handley 1976), savannas (Emmons and Feer 1990), and disturbed habitats (Handley 1976). We collected four adult males (MN 79798, 79802, 79839, 80550) and one adult female (MN 80551). Two adult males (MN 79798, 79802) were collected in a seasonally flooded forest (buritizal; 14°28′37″ S, 055°42′05″ W), another (MN 79839) was collected in a pasture area (14°29′33″ S, 055°42′19″ W). These were found in forested areas with dense canopies. The other two specimens (MN 80550, 80551) were collected near a cave that is adjacent to a clearing area (14°31′30″ S, 055°47′57″ W).

Lonchorhina aurita is a medium-sized species for the genus (FA 47–54 mm; Reis et al. 2013; Williams and Genoways 2008). All specimens we collected have a very long and narrow noseleaf, which is pointed and similar to the ears in length (Figure 4). The tragus is narrow and pointed, at least as long as half of the length of the ear. The coloration varies from reddish-brown to blackish in the dorsum, and slightly lighter in the belly. The dental formula is i 2/2, c 1/1, p 2/3, m 3/3 = 34. The inner upper incisors are chisel-shaped and larger than the outer incisors, which are short, with pointed cusps, and project inward (Figure 5). The lower incisors are comparatively flat and trilobed, and form a complete row with the canines. The first upper and the second lower premolar are reduced in size relative to the other premolars. All of the characteristics described here were previously observed by Tomes (1863), Hernandez-Camacho and Cadena (1978), and Peracchi et al. (2011).

Figure 4. A specimen of *L. aurita* showing the large, pointed noseleaf, which is similar in length to the ears; and the tragus that is narrow and pointed. Photography by Dayana de Paula Bolzan, Universidade Federal do Rio de Janeiro.

Figure 5. Upper incisors of *L. aurita* (MN 79839) showing the chisel-shaped inner incisors and pointed cusps of outer incisors.

Micronycteris microtis Miller, 1898

In Brazil, this species has been recorded in the states of Amazonas, Amapá, Rondônia, Bahia, Pará, Rio de Janeiro, São Paulo, Minas Gerais and Espírito Santo (Peracchi et al. 2011; Reis et al. 2013; Moras et al. 2014). The species occurs in primary and secondary forests, forest fragments, pastures, orchards and near urban areas (Reid 1997; Reis et al. 2013). We collected two adult males (MN 80534, 80573), one (MN 80534) in a forested area in front of a cave (14°31′30″ S, 055°47′57″ W), and other (MN 80573) in a forest with babassu palm (14°30′26″ S, 055°45′29″ W).

This species is relatively small (FA 32.5–36.6 mm; Reis et al. 2013), when compared with other congeners. The species can be distinguished from *Micronycteris megalotis* (Gray, 1842) by the length of the ears, less than 22 mm in *M. megalotis*, and the length of the fur on the lower one-third of the medial surface of the pinna, 8 mm or shorter in *M. megalotis* (Williams and Genoways 2008). However, there are some controversies. According to Simmons (1996), *M. microtis* from Paracou has a short fur on the leading edge of the ear (≤ 3 mm), while according to the original description by Miller (1898), the fur is 5 mm or less. Miller (1898) also considered that the middle lower premolar is relatively larger in *M. microtis* than in *M. megalotis*. The dental formula is i2/2, c 1/1, p 2/3, m 3/3 = 34. The specimens that we collected have brownish ventral and dorsal fur, ear length less than 22 mm (Table 2), and fur length of the leading edge of the pinnae less than 8 mm (4 mm and 5 mm). Therefore, we identified these specimens as *M. microtis* following Williams and Genoways (2008). The skull and the mandible of the MN 80534 are illustrated in the figures 6a and 6b. It is possible to note that there is no gap between the upper incisors and the canines; the internal upper incisors are larger than the external; and the p2 is larger than both p3 and p4.

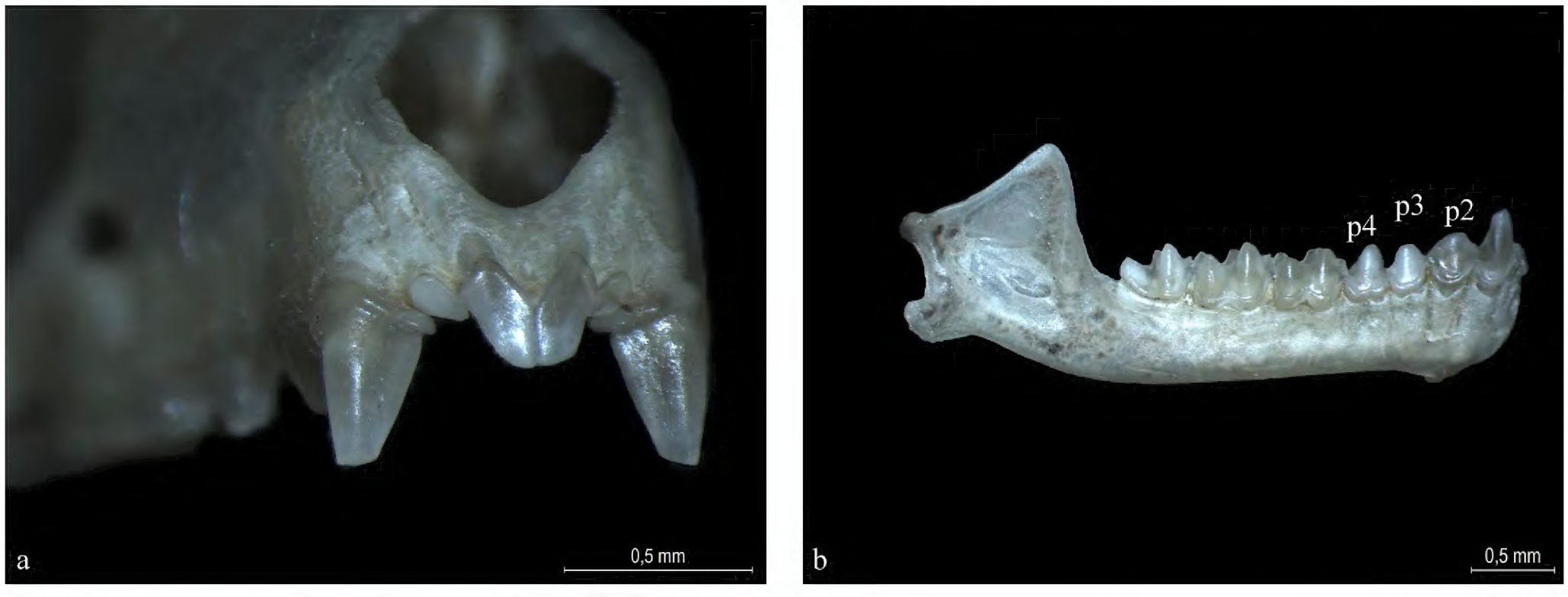

Figure 6. Upper incisors and canines (**a**) and mandible (**b**) of *M. microtis* (MN 80534).

Figure 7. Specimen of *M. sanborni* (MN 80572) showing the white ventral fur that extends anteriorly onto the throat and chin.

Figure 8. Deeply notched middle interauricular band of *M. sanborni* (MN 80572) characterized by triangular-shaped flaps.

Micronycteris sanborni Simmons, 1996

In Brazil, this species has been recorded in the states of Ceará, Paraíba, Pernambuco, Sergipe, Minas Gerais, Tocantins (Reis et al. 2013) and Amazonia (López-Baucells et al. 2013), whereas Peracchi et al. (2011) considered only the states of Ceará, Pernambuco, Piauí, and Mato Grosso do Sul. *Micronycteris sanborni* was apparently restricted to the dry diagonal areas (Peracchi et al. 2011) that extend from the northeast to the west of Brazil, until the new record of this species for Amazonas state, in a humid tropical ecosystem (López-Baucells et al. 2013). We collected one adult male (MN 79755) in a cerrado *sensu stricto* area (14°28′33″ S, 055°44′14″ W) and one adult female (MN80572) in a seasonally flooded forest (cambarazal; 14°29′26″ S, 055°44′47″ W).

Micronycteris sanborni is a small species (FA 32–34 mm; Reis et al. 2013). Our specimens are characterized by the white ventral fur that extends medially onto the throat and chin (Figure 7). The dorsal hairs are bicolored (brownish with white bases), and there is a small patch of white fur on the ventral surface of the uropatagium at the base of the tail. The pinnae are large with rounded tips, and a high band of skin deeply notched in the middle can be observed between the ears, resulting in a flap triangular appearance (Figure 8). The ventral edge of the horseshoe of noseleaf is defined by a thick ridge. The cranial and dental features include an uninflated rostrum and anterior orbital region; the mastoid breadth greater than the zygomatic breadth; and a gap between the outer upper incisor and canine (Figure 9). The P3 is lower than P4 and smaller in the anteroposterior length; lower incisors are small and bilobed, the crown height of p2 is lesser than or equal to its length, and the p3 is tiny and much smaller than p2 and p4. The dental formula is i 2/2, c 1/1, p 2/3, p 3/3 = 34. All the features described by Simmons (1996) were observed in our specimens.

Micronycteris schmidtorum Sanborn, 1935

In Brazil, this species has been recorded in the states of Amazonas, Pará, Amapá, Tocantins, Ceará, Pernambuco, Bahia, and Minas Gerais (Peracchi et al. 2011 and Reis et al. 2013). *Micronycteris schmidtorum* can be found in evergreen forest, thorn forest, swamps, pastures, and orchards (Williams and Genoways 2008). We collected one adult male (MN 80523) in a cerrado *sensu stricto* area (14°28′40″ S, 055°43′19″ W).

The MN 80523 has a grayish buff venter, which conspicuously paler than the dorsum. The calcar is longer than the foot (Table 2), the interfemoral membrane is more than twice the length of the tail, and there is a moderately deep notch in ear band (Figure 10). Cranial features include: upper premolars almost equal in height; P3 about three-quarters of the size of P2; no marked gap between I2 and canine (Figure 11); slightly reduced p3 when compared with p2 and p4 (Figure 12). The dental formula is i 2/2, c 1/1, p 2/3, m 3/3 = 34. Simmons (1996) emphasized that the coronoid process is somewhat higher in this species than that observed in

Figure 9. Oblique view of the anterior upper dentition of *M. sanborni* (MN 79755) showing the gap (indicated by arrow) between the outer upper incisors and canines.

Figure 10. Specimen of *M. schmidtorum* (MN 80523) showing an ear band with moderated deep notch.

Figure 11. Oblique view of the anterior upper dentition of *M. schmidtorum* (MN 80523) showing no marked gap (indicated by arrow).

M. sanborni and *M. minuta*. This feature can be observed in our specimen when compared with *M. sanborni*. All of the characteristics described here were previously observed by Sanborn (1935), Simmons (1996), and Williams and Genoways (2008).

Platyrrhinus brachycephalus (Rouk & Carter, 1972)

In Brazil, this species has been recorded in the states of Acre, Amazonas, Pará, Amapá, Goiás, and Distrito Federal (Gardner 2008b; Peracchi et al. 2011; Reis et al. 2013). *Platyrrhinus brachycephalus* is found in subtropical humid forest habitats, coastal areas, dense forests, forest fragments and Amazonian savannas (Cerrado; Reis et al. 2013). We collected one adult female (MN 79726) in a clearing inside a forest area with dense canopy, near Babassu forest (14°29′26″ S, 055°44′47″ W).

This species is a small-sized *Platyrrhinus* (FA 33–42 mm; Reis et al. 2013). Our specimen presents the following features: dorsal fur brownish, and ventral fur tricolored; the skull is short and broad; the M1 protocone is well developed; the paraoccipital process is poorly developed; the upper incisors are separated from each other; the inner incisors are monolobed and separated from each other. The anterolingual crista of p4 has two well-developed accessory cuspulids (Figures 13a, b), which we considered one of the most relevant diagnostic characteristics and was clearly noted in our specimen. The dental formula is i 2/2, c 1/1, p 2/2, m 3/3 = 32. All of the characteristics described here were previously observed by Rouk and Carter (1972), Gardner (2008b), Velazco et al. (2010) and Reis et al. (2013).

Figure 12. Lateral view of the jaw and dentition of *M. schmidtorum* (MN 80523). The p3 is only slightly reduced and the coronoid process is higher in this species.

Platyrrhinus recifinus (Thomas, 1901)

This species was considered endemic to eastern and southeastern Brazil (Gardner 2008b), and has been recorded in the states of Alagoas, Bahia, Ceará, Espírito Santo, Minas Gerais, Paraíba, Pernambuco, Paraná, Rio de Janeiro, São Paulo, and Santa Catarina (Reis et al. 2013). The species occurs in wet forests in the Caatinga, the Atlantic forest, and cerrado formations (Reis et al. 2013). This is the first record of this species from Central Brazil. We collected one adult male (MN 79739) in a babassu forest (14°28′59″ S, 055°43′01″ W).

The specimen showed the follow characteristics: dorsal and ventral fur brownish; interramal vibrissae absent; postorbital process moderately developed (Figure 14); paraoccipital process moderately developed (Figure 15); upper median incisors not in contact (Figure 16); and upper lateral incisors unilobed. The third metacarpal (41.3 mm) is longer than the fifth metacarpal (40.8 mm). The dental formula for this species is i 2/2, c 1/1, p 2/2, m 3/3 = 32. These characteristics were previously observed by Velazco (2005) and are diagnostic for this species. It was difficult to verify some features described by this author, such as the four color bands in the dorsal fur and

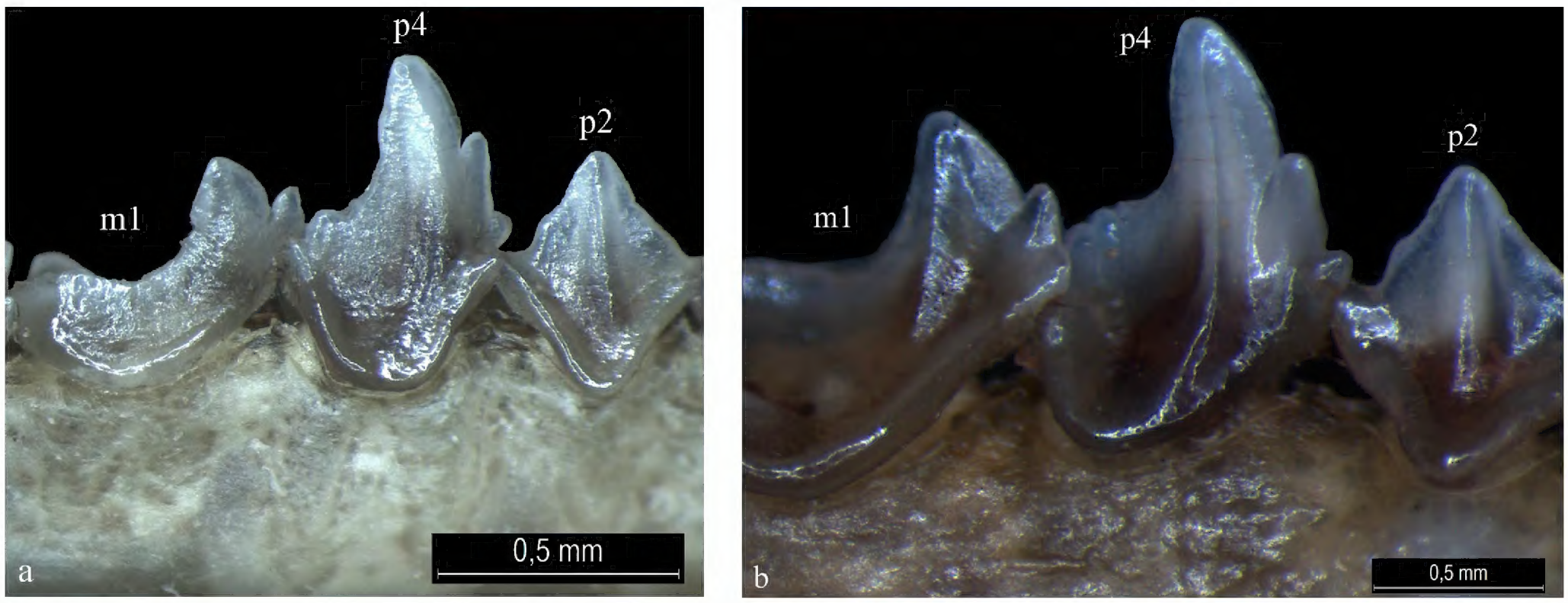

Figure 13. Labial (**a**) and lingual (**b**) views of the inferior premolars in *P. brachycephalus* (MN 79726) showing two stylid cusps on the anterior face of p4.

Figure 14. Skull of *Platyrrhinus recifinus* (MN 79739) showing the moderately developed postorbital process (indicated by arrow).

Figure 15. Lateral view of the skull of *P. recifinus* (MN 79739) showing the moderately developed paraoccipital process (indicated by arrow).

the sail-shaped crown of p2. Furthermore, the forearm length is longer than expected for the species (42–46 mm; Velazco et al. 2010). Despite of these inconsistencies, the characters showed in Figures 14, 15 and 16 are diagnostics for the species and differ from all specimens of *Platyrrhinus lineatus* (*É*. Geoffroy, 1810) collected in the same region, which have the paraoccipital and postorbital processes well developed and the upper median incisors in contact.

Figure 16. Frontal view of the dentition of *P. recifinus* (MN 79739) showing that the upper internal incisors are not in contact.

General remarks

The present study adds eight new records of bats for the state of Mato Grosso, a poorly surveyed region (Bernard et al. 2011; Sousa et al. 2011; Oliveira et al. 2013; Sousa et al. 2013); and two new records for the Cerrado biome (*M. microtis* and *P. brachycephalus*). Among the new records, *M. sanborni* is currently classified as an IUCN Data Deficient Species ([DD] Tavares and Aguirre 2008).

Platyrrhinus brachycephalus was considered endemic to the Amazon biome, whereas *M. microtis* has been recorded in the Amazon and Atlantic Forest biomes (Paglia et al. 2012). In the present study, we emphasize the importance of these new records for the Cerrado,

although *P. brachycephalus* has been recorded in Cerrado habitats within the Amazon. Furthermore, this is the first record of *P. recifinus* from Central Brazil showing that its distribution is probably broader than that currently known. Other species that we report here are known from adjacent localities.

The new records for *Micronycteris microtis, M. sanborni* and *M. schmidtorum* reveal these three species in sympatry. There are other two species of the genus, *M. megalotis* (Gray, 1842) and *M. minuta* (Gervais, 1856), which occur in the state of Mato Grosso, but were not collected in the study area. Additionally, the two species of *Platyrrhinus* recorded here (*P. brachycephalus* and *P. recifinus*) occur in sympatry with other two species of the genus, *P. incarum* (Thomas, 1912) and *P. lineatus*. All of these species that were already known for the region have wide distributions in Brazil (Reis et al. 2013). None of the other new records have congeners occurring in the same region.

Among the habitats sampled, we registered four species of *Platyrrhinus* (*P. brachycephalus*, *P. recifinus*, *P. incarum* and *P. lineatus*) in the babassu forest, indicating that this formation might be preferable for different species of *Platyrrhinus*. Moreover, the presence of rivers and creeks may favor species occurrences. Attempts to associate the occurrence of bats with their micro-scale habitats are important to predict species occurrence, which is useful to identify priority areas for species conservation.

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